

WE CLAIM:

- 1 1. A controlled release pharmaceutical composition of tamsulosin, the composition
2 comprising:
 - 3 (a) a spheroid core comprising:
 - 4 i. tamsulosin,
 - 5 ii. about 10% to about 45% w/w of a spheronizing agent,
 - 6 iii. one or more of rate controlling polymers, and;
 - 7 (b) an enteric coating over the spheroid core.
- 1 2. The composition of claim 1, wherein the tamsulosin comprises free base,
2 pharmaceutically acceptable salts and isomers of tamsulosin.
- 1 3. The composition of claim 2, wherein the pharmaceutically acceptable salts of
2 tamsulosin comprise one or more of hydrochloride, hydroiodide, hydrobromide,
3 and hydrogen fumarate..
- 1 4. The composition of claim 3, wherein the pharmaceutically acceptable salt of
2 tamsulosin is a hydrochloride.
- 1 5. The composition of claim 1, wherein the composition comprises a concentration
2 from about 0.03% to about 0.33% by weight of tamsulosin.
- 1 6. The composition of claim 1, wherein the spheronizing agent is microcrystalline
2 cellulose.
- 1 7. The composition of claim 1, wherein the rate controlling polymer comprises one or
2 more of enteric polymers, water insoluble polymers, water soluble polymers,
3 alkaline metal salts of a higher fatty acid, waxes, and mixtures thereof.
- 1 8. The composition of claim 1, wherein the composition comprises from about 20%
2 to about 90% by weight of rate controlling polymers.
- 1 9. The composition of claim 7, wherein the enteric polymer comprises one or more of
2 hydroxypropylmethyl cellulose phthalate, cellulose acetate phthalate, methacrylic
3 acid and ethyl acrylate copolymer.
- 1 10. The composition of claim 9, wherein the enteric polymer comprises one or more of
2 methacrylic acid and ethyl acrylate copolymer.

- 1 11. The composition of claim 7, wherein the wax comprises one or more of
2 hydrogenated vegetable oils, esters of long chain fatty acids, long chain fatty acids,
3 and mixtures thereof.
- 1 12. The composition of claim 11, wherein the wax is glyceryl monostearate.
- 1 13. The composition according to claim 11, wherein the wax is stearic acid.
- 1 14. The composition of claim 7, wherein the water soluble polymer comprises one or
2 more of polyvinylpyrrolidone, hydroxypropyl cellulose, carboxymethylcellulose
3 sodium, hydroxypropylmethyl cellulose, hydroxyethyl cellulose, methyl cellulose,
4 and mixtures thereof.
- 1 15. The composition of claim 7, wherein the water insoluble polymer comprises one or
2 more of ethyl cellulose, cellulose acetate, methacrylic acid-acrylic acid copolymers
3 with quaternary ammonium groups, and mixtures thereof.
- 1 16. The composition of claim 7, wherein the alkaline metal salts of higher fatty acid
2 comprise one or more of magnesium stearate, zinc stearate, calcium stearate, and
3 mixtures thereof.
- 1 17. The composition of claim 16, wherein the alkaline metal salt of higher fatty acid is
2 magnesium stearate.
- 1 18. The composition of claim 1, wherein the spheroid core includes one or more of
2 pharmaceutically acceptable excipients.
- 3 19. The composition of claim 18, wherein the pharmaceutically acceptable excipients
4 include plasticizers, diluents, colorants, and flavoring agents.
- 1 20. The composition of claim 1, wherein the enteric coating layer comprises one or
2 more of hydroxypropyl methylcellulose phthalate, polyvinyl phthalate, cellulose
3 acetate phthalate, copolymers of acrylic and methacrylic acid, and mixtures
4 thereof.
- 1 21. The composition of claim 20, wherein the enteric coating includes one or more of
2 alkalizing agents, plasticizer, tack-modifiers and opacifiers.
- 1 22. The composition of claim 1, wherein the composition comprises capsules, sachets,
2 and tablets.

- 1 23. A process for the preparation of a controlled release pharmaceutical composition of
2 tamsulosin, the process comprising:
- 3 (a) granulating tamsulosin, spheronizing agent and one or more rate controlling
4 polymers to obtain a granulating mixture,
- 5 (b) extruding the granulated mixture to obtain extrudates,
- 6 (c) spheronizing the extrudates to obtain spherical cores,
- 7 (d) drying the spheroid cores; and
- 8 (e) coating the spheroid cores with an enteric polymer.
- 1 24. The process of claim 24, wherein the tamsulosin comprises free base,
2 pharmaceutically acceptable salts and isomers of tamsulosin.
- 1 25. The process of claim 24, wherein the pharmaceutically acceptable salts of
2 tamsulosin comprise hydrochloride, hydroiodide, hydrobromide, and hydrogen
3 fumarate.
- 1 26. The process of claim 25, wherein the pharmaceutically acceptable salt of
2 tamsulosin is a hydrochloride.
- 1 27. The process of claim 23, wherein the pharmaceutical composition comprises a
2 concentration of about 0.03% to about 0.33% by weight of tamsulosin.
- 1 28. The process according to claim 23, wherein the spheronizing agent is
2 microcrystalline cellulose.
- 1 29. The process of claim 23, wherein the rate controlling polymer comprises one or
2 more of enteric polymers, water insoluble polymers, water-soluble polymers,
3 alkaline metal salts of a higher fatty acid, waxes, and mixtures thereof.
- 1 30. The process of claim 23, wherein the pharmaceutical composition comprises a
2 concentration of about 20% to about 90% by weight of rate controlling polymers.
- 1 31. The process of claim 29, wherein the enteric polymer comprises one or more of
2 hydroxylpropylmethyl cellulose phthalate, cellulose acetate phthalate, methacrylic
3 acid and ethyl acrylate copolymer.
- 1 32. The process of claim 31, wherein the enteric polymer comprises one or more of
2 methacrylic acid and ethyl acrylate copolymer.

- 1 33. The process of claim 29, wherein the wax comprises one or more of hydrogenated
2 vegetable oils, esters of long chain fatty acids, long chain fatty acids, and mixtures
3 thereof.
- 1 34. The process of claim 33, wherein the wax is glyceryl monostearate.
- 1 35. The process of claim 33, wherein the wax is stearic acid.
- 1 36. The process of claim 29, wherein the water soluble polymer comprises one or more
2 of polyvinylpyrrolidone, hydroxypropyl cellulose, carboxymethylcellulose sodium,
3 hydroxypropylmethyl cellulose, hydroxyethyl cellulose, methyl cellulose, and
4 mixtures thereof.
- 1 37. The process of claim 29, wherein the water insoluble polymer comprises one or
2 more of ethyl cellulose, cellulose acetate, methacrylic acid-acrylic acid copolymers
3 with quaternary ammonium groups, and mixtures thereof.
- 1 38. The process of claim 29, wherein the alkaline metal salts of higher fatty acids
2 comprise one or more of magnesium stearate, zinc stearate, calcium stearate, and
3 mixtures thereof.
- 1 39. The process of claim 38, wherein the alkaline metal salt of higher fatty acid is
2 magnesium stearate.
- 1 40. The process of claim 23, wherein the spheroid core includes one or more of
2 pharmaceutically acceptable excipients
- 1 41. The process of claim 40, wherein the pharmaceutically acceptable excipient
2 comprises one or more of plasticizers, diluents, colorants or flavoring agents.
- 1 42. The process of claim 23, wherein the enteric coating comprises enteric polymers.
- 1 43. The process of claim 42, wherein the enteric polymer comprises one or more of
2 hydroxypropyl methylcellulose phthalate, polyvinyl phthalate, cellulose acetate
3 phthalate, copolymers of acrylic and methacrylic acid, and mixtures thereof.
- 1 44. The process of claim 42, wherein the enteric coating comprises one or more of
2 alkalizing agents, plasticizer, tack-modifiers and opacifiers.
- 1 45. The process of claim 23, wherein the composition is filled into capsules, sachets,
2 or compressed into tablets.

1 46. A process for the preparation of a controlled release pharmaceutical composition of
2 tamsulosin, the process comprising:

- 3 (a) granulating tamsulosin and spheronizing agent with dispersion of one or
4 more of rate controlling polymers to obtain granulates,
5 (b) extruding the granulates to form extrudates using extruder,
6 (c) spheronizing the extrudates until spherical cores are formed; and
7 (d) coating the spherical cores with an enteric polymer.

1 47. The process of claim 46, wherein the tamsulosin comprises free base,
2 pharmaceutically acceptable salts and isomers of tamsulosin.

1 48. The process of claim 47, wherein the pharmaceutically acceptable salts of
2 tamsulosin comprise hydrochloride, hydroiodide, hydrobromide, and hydrogen
3 fumarate.

1 49. The process of claim 48, wherein the pharmaceutically acceptable salt of
2 tamsulosin is a hydrochloride.

1 50. The process of claim 46, wherein the pharmaceutical composition comprises a
2 concentration of about 0.03% to about 0.33% by weight of tamsulosin.

1 51. The process of claim 46, wherein the spheronizing agent is microcrystalline
2 cellulose.

1 52. The process of claim 46, wherein the rate controlling polymer comprises one or
2 more of enteric polymers, water insoluble polymers, water-soluble polymers,
3 alkaline metal salts of a higher fatty acid, waxes, and mixtures thereof.

1 53. The process of claim 46, wherein the pharmaceutical composition comprises a
2 concentration of about 20% to about 90% by weight of rate controlling polymers.

1 54. The process of claim 52, wherein the enteric polymer comprises one or more of
2 hydroxylpropylmethyl cellulose phthalate, cellulose acetate phthalate, methacrylic
3 acid and ethyl acrylate copolymer.

1 55. The process of claim 54, wherein the enteric polymer comprises one or more of
2 methacrylic acid and ethyl acrylate copolymer.

- 1 56. The process of claim 52, wherein the wax comprises one or more of hydrogenated
2 vegetable oils, esters of long chain fatty acids, long chain fatty acids, and mixtures
3 thereof.
- 1 57. The process of claim 56, wherein the wax is glyceryl monostearate.
- 1 58. The process of claim 56, wherein the wax is stearic acid.
- 1 59. The process of claim 52, wherein the water soluble polymer comprises one or more
2 of polyvinylpyrrolidone, hydroxypropyl cellulose, carboxymethylcellulose sodium,
3 hydroxypropylmethyl cellulose, hydroxyethyl cellulose, methyl cellulose, and
4 mixtures thereof.
- 1 60. The process of claim 52, wherein the water insoluble polymer comprises one or
2 more of ethyl cellulose, cellulose acetate, methacrylic acid-acrylic acid copolymers
3 with quaternary ammonium groups, and mixtures thereof.
- 1 61. The process of claim 52, wherein the alkaline metal salts of higher fatty acids
2 comprise one or more of magnesium stearate, zinc stearate, calcium stearate, and
3 mixtures thereof.
- 1 62. The process of claim 61, wherein the alkaline metal salt of higher fatty acid is
2 magnesium stearate.
- 1 63. The process of claim 46, wherein the spheroid core includes one or more of
2 pharmaceutically acceptable excipients
- 1 64. The process of claim 63, wherein the pharmaceutically acceptable excipient
2 includes one or more of plasticizers, diluents, colorants, and flavoring agents.
- 1 65. The process of claim 46, wherein the enteric coating comprises enteric polymers.
- 1 66. The process of claim 65, wherein the enteric polymer comprises one or more of
2 hydroxypropyl methylcellulose phthalate, polyvinyl phthalate, cellulose acetate
3 phthalate, copolymers of acrylic and methacrylic acid, and mixtures thereof.
- 1 67. The process of claim 46, wherein the enteric coating comprises one or more of
2 alkalizing agents, plasticizer, tack-modifiers and opacifiers.
- 1 68. The process of claim 46, wherein the composition is filled into capsules, sachets,
2 or compressed into tablets.

- 1 69. A method of treating symptoms of benign prostatic hyperplasia, comprising
2 administering a controlled-release pharmaceutical composition of tamsulosin, the
3 composition comprising:
- 4 (a) a spheroid core comprising:
- 5 i. tamsulosin,
- 6 ii. about 10% to about 45% w/w of a spheronizing agent, and
7 iii. rate controlling polymers, and;
- 8 (b) an enteric coating over the spheroid core.
- 1 70. A controlled-release pharmaceutical composition comprising one or more
2 individual units comprising:
- 3 (a) a spheroid core comprising:
- 4 i. tamsulosin,
- 5 ii. about 10% to about 45% w/w of a spheronizing agent, and
6 iii. rate controlling polymers, and;
- 7 (b) an enteric coating over the spheroid core.
- 1 71. The composition of claim 70, wherein the composition is filled into capsules,
2 sachets, or compressed into tablets.